

REMARKS

Applicants have amended the claims in order to more particularly define the invention taking into consideration the outstanding Official Action. In this regard, Applicants have carefully noted the Examiner's comments with respect to the final product and have canceled all of the claims from the application and replaced them with a new claim set of claims 17 to 30. These claims do not define the interim substrate and are fully supported by Applicants' specification. These claims clearly distinguish over the prior art of record. Applicants most respectfully submit that all the claims now present in the application are in full compliance with 35 U.S.C. 112 and are clearly patentable over the references of record.

The rejection of claims 1, 3 and 7 under 35 U.S.C. 103 as being unpatentable over Kawahara et al. 6,111,306 has been carefully considered but is most respectfully traversed.

As discussed in Applicants' specification, the present invention relates to a structure of semiconductor package without substrate and particularly a semiconductor package which has no substrate for reducing the package thickness and enhancing production yield which are important aspects of the invention.

In one aspect of the invention, an interim substrate is provided and this substrate is covered by a solder mask at selected areas. The surface of the interim substrate that are not covered by the solder mask have a plurality of lead layers and die pad layers formed thereon at selected locations. The interim substrate provides a firm support base for bonding wires soldering on the lead layers during wire bonding processes. After the molding process is completed and the individual chips are isolated, the interim substrate is removed by an etching process none of which is taught to one of ordinary skill in the art by the Kawahara et al. reference.

Applicants wish to direct the Examiner's attention to the basic requirements of a prima facie case of obviousness as set forth in the MPEP § 2143. This section states that to establish a prima facie case of obviousness, three basic criteria first must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to

modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Section 2143.03 states that all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

In the Official Action it is urged that with respect to claims 1 and 3 that Kawahara disclose a semiconductor package comprising an interim substrate having front and back surfaces. However, there is no indication of a reference element for this interim substrate suggested in the Official Action. An insulating material 559 in Figure 135A comprising conventional polyimide, solder mask is formed at select locations on the front surface of the interim substrate. Again, there is nothing which suggests the interim substrate of the present invention or the specific limitations of newly presented claims 17 and 18 absent an interim substrate. The necessary motivation to modify the prior art must be found in the prior art and Applicants' specification may not be used as a teaching reference.

Clearly, the rejection is using hindsight reconstruction to pick and choose from the prior art those portions which are then urged to render obvious the presently claimed invention. For example, column 72 of the patent relates to a plating process with respect to the semiconductor element mounting substrate 560 having the mechanical bumps 514. There are no mechanical bumps present in the presently claimed invention and there is no suggestion to remove these mechanical bumps. The plating process is carried out by electroplating for example. There is no electroplating suggested in the presently claimed invention. *In re Fritch*, 23 USPQ 1780, 1784 (Fed. Cir. 1992) ("It is impermissible to engage in hindsight reconstruction of the claimed

invention, using the applicant's structure as a template and selecting elements from references to fill the gaps.).

A removal process is described at column 72 beginning at line 35, to remove the plating resist 559 after the conductive metal layer 528 is formed on the surface of the mechanical bump 514. Clearly, there is no suggestion contrary to the assertion in the Official Action that the interim substrate is removed etched in accordance with the presently claimed invention.

It is acknowledged in the Official Action that the Kawahara et al. reference failed to specify the process sequence steps in order for singulating, separating the package followed by the etching of the interim substrate. However, the Official Action chooses to ignore these limitations and urges that they are not material to the examination and consideration of the patentability of the substrate. However, these are claim limitations which cannot simply be ignored. All material limitations in a claim must be taken into consideration in evaluating the patentability of the claimed invention. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claims 2, 4-6 and 8 under 35 U.S.C. 103 as being unpatentable over Kawahara et al. in view of Fukutomi et al. and Fjelstad et al. has been carefully considered but is respectfully traversed.


In the Official Action it is urged that regarding claims 2 and 8 Kawahara disclose the interim substrate and die pad being made of organic material and copper, respectively. Specific reference is made to column 59, line 36, column 72, line 65. However, this refers to the insulating layer and which is noted may be spin coated on the top surface of the semiconductor element mounting substrate 402 and then subjected to thermal processing. This in no way suggests the presently claimed invention. Again, Applicants' specification is being used to provide the necessary teaching for modification of the reference to achieve the presently claimed invention. This is clearly impermissible hindsight and does not form the basis of a tenable rejection under 35 U.S.C. 103. Accordingly, it is most respectfully requested that this aspect of the rejection be withdrawn.

The teaching Fukutomi et al. relates to conventional aspects and again, there was nothing which would lead one of ordinary skill in the art to make the necessary

modification of the Kawahara reference based on Fukutomi et al. absence Applicants' disclosure. Obvious to try and Applicants' specification may not be used as a teaching reference to formulate an obviousness rejection. Accordingly, it is most respectfully requested that this aspect of the rejection be withdrawn.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all the claims now present in the application are most respectfully requested.

Respectfully submitted,
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